

## PATENT SPECIFICATION

Application Date: Nov. 6, 1936. No. 30270/36.

476,836

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## PROVISIONAL SPECIFICATION

## Improvements in or relating to Electric Discharge Devices having an Inner Envelope and an Outer Jacket Capped at One End

We, THE GENERAL ELECTRIC COMPANY LIMITED, of Magnet House, Kingsway, London, W.C.2, a British company, do hereby declare the nature of this invention (a communication from Patent-Treib- und Gesellschaft für Elektrische Glühlampen m.b.H., of 11/14 Ehrenbergstrasse, Berlin O.17, Germany; a German company) to be as follows:—

10 This invention relates to electric discharge devices (and more particularly high-pressure mercury-vapour lamps) of the type having a sealed outer jacket surrounding the inner discharge envelope, 15 which jacket carries at one end only a cap (or the equivalent of a cap) to whose terminals the leads to the inner envelope are connected. The object of the invention is to provide a simple and mechanically satisfactory construction for discharge devices of this type.

According to the invention in devices of the type specified the outer jacket is closed at the end bearing the cap by a 25 ceramic body, through passages in which the leads to the inner envelope pass.

Two embodiments of the invention will now be described by way of example with reference to the accompanying 30 drawing, in which Figure 1 is a longitudinal section of one embodiment and Figure 2 a longitudinal section of the lower end of the second embodiment.

In both figures 1 is the inner envelope 35 of tubular shape, containing electrodes 2, 3, at either end, supported on leads 4, 5, passing through sealing pins 6, 7 at either end of the envelope. 8 is a ceramic plate closing the end of the 40 outer jacket 20, shaped like a bell-jar; it is made of one of the known ceramic materials that are adapted to be sealed to glass, for example a mixture of titanium oxide and magnesium oxide in equal 45 proportions. The inner envelope is supported from the plate 8 by means of

the stout leads 11, 12, to whose ends the pins 6 and 7 are clamped, and which are connected to the leads 4, 5 by the wires 13, 14. The lower ends of the leads 11, 12 50 enter holes 9, 10 in the upper surface of the plate 8, and are prolonged by finer wires 17, 18 passing through narrower holes 15, 16 prolonging the holes 9, 10. The wires 17, 18 are hermetically sealed 55 in the holes 15, 16 by means of enamel.

In Figure 1 the outer jacket is a plain bell jar; the plate 8 has a flange 19 on which it rests; it is sealed to the plate 60 by means of enamel 27. To a suitably shaped projection from the lower side of the plate is affixed the screw cap 24, preferably by means of cement; the leads 17 are connected respectively to the body of the cap and to its insulated central 65 contact. Through the centre of the plate is drilled the hole 21 into the outer end of which is sealed by means of enamel the pumping tube 23.

In Figure 2 the outer jacket is a Dewar 70 flask of bell-jar shape, whose rim is sealed into a groove in the upper surface of the plate 8. The screw cap is replaced by the pins 25, 26 (which are, of course equivalent to a cap), fixed into the lower 75 side of the plate 8 and connected respectively to the leads 17, 18. The parts 21 and 23 are as in Figure 1.

In the manufacture of the device, the leads 11, 12, 17, 18 are first sealed 80 through the plate. The inner envelope 1 is then affixed to the leads 11, 12. The outer jacket 20 is then sealed to the plate and evacuated through the tube 23, which is then sealed off, as 85 shown. Finally the cap or its equivalent is fixed to the plate and the leads connected to it.

Dated the 6th day of November, 1936.

For the Applicants,

NORMAN R. CAMPBELL.

## COMPLETE SPECIFICATION

## Improvements in or relating to Electric Discharge Devices having an Inner Envelope and an Outer Jacket Capped at One End

We, THE GENERAL ELECTRIC COMPANY LIMITED, of Magnet House, Kingsway,

London, W.C.2, a British company, do hereby declare the nature of this inven-

[Price 1/-]

tion (a communication from Patent-Treuhand-Gesellschaft für elektrische Glühlampen m. b. H. of 11/14 Ehrenbergstrasse, Berlin O.17, Germany, a German company) and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to electric discharge devices (and more particularly high-pressure mercury-vapour lamps) of the type having a sealed outer jacket surrounding the inner discharge envelope, which jacket carries at one end only terminals to which the leads to the inner envelope are connected and which are adapted to be connected to supply terminals. The object of the invention is to provide a simple and mechanically satisfactory construction for discharge devices of this type.

According to the invention in devices of the type specified the outer jacket is closed at the end bearing the terminals by a ceramic body, through passages in which the leads to the inner envelope pass.

Two embodiments of the invention will now be described by way of example with reference to the drawing accompanying the provisional specification, in which Figure 1 is a longitudinal section of one embodiment and Figure 2 a longitudinal section of the lower end of the second embodiment.

In both figures 1 is the inner envelope of tubular shape and of glass or quartz, containing electrodes 2, 3, one at each end, supported on leads 4, 5 passing through sealing pips 6, 7 at the ends of the envelope. 8 is a ceramic plate closing the end of the glass outer jacket 20, shaped like a long bell-jar; the plate is made of one of the known ceramic materials that are adapted to be sealed to glass, for example a mixture of titanium oxide and magnesium oxide in equal proportions. The inner envelope is supported from the plate 8 by means of the stout leads 11, 12, to whose ends the pips 6 and 7 are clamped, connected to the leads 4, 5 by the wires 13, 14. The lower ends of the leads 11, 12 enter holes 9, 10 in the upper surface of the plate 8, and are prolonged by finer wires 17, 18 passing through narrower holes 15, 16 prolonging the holes 9, 10. The wires 17, 18 are hermetically sealed in the holes 15, 16 by means of enamel.

In Figure 1 the outer jacket is a plain bell-jar; the plate 8 has a flange 19 on which it rests; the jacket is sealed to the plate by means of enamel 27. To a suitably shaped projection from the lower side of the plate is affixed the screw cap

24, preferably by means of cement; the leads 17 are connected respectively to the body of the cap and to its insulated central contact, which are the terminals adapted to be connected to supply terminals on a corresponding socket. Through the centre of the plate is drilled the hole 21 into the outer end of which the pumping tube 23 is sealed by means of enamel.

In Figure 2 the outer jacket is a Dewar flask of bell-jar shape, whose rim is sealed into a groove in the upper surface of the plate 8. The screw cap is replaced by the terminals pins 25, 26, fixed into the lower side of the plate 8 and connected respectively to the leads 17, 18; these pins are adapted to enter the holes of a corresponding socket. The parts 21 and 23 are as in Figure 1.

In the manufacture of the device shown in Figure 1, the leads 11, 12, 17, 18 are first sealed through the plate. The inner envelope 1 is then affixed to the leads 11, 12. The outer jacket 20 is then sealed to the plate and evacuated through the tube 23, which is then sealed off, as shown. Finally the cap is fixed to the plate and the leads connected to it. The manufacture of the device shown in Figure 2 will proceed similarly, but the terminals 25, 26 may be affixed before the jacket 20.

One of the main advantages attained by the invention is the absence of any distortion of the jacket, such as is almost inevitable in the usual method of construction, in which the jacket is terminated by a foot-tube. The appearance of the finished device is therefore neater, and the jacket, being less strained, is less liable to crack.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An electric discharge device of the type specified wherein the outer jacket is closed at the end bearing the terminals by a ceramic body through passages in which the leads to the inner envelope pass.

2. A device according to Claim 1 wherein the said ceramic body is composed of a mixture of magnesium oxide and titanium oxide in equal proportions.

3. An electric discharge device substantially as hereinbefore described with reference to Figure 1 or Figure 2 of the drawing accompanying the provisional specification.

4. The manufacture of a device according to any preceding claim wherein the leads are first sealed through the ceramic

plate, the inner envelope then supported from the leads, and the outer jacket then sealed to the said plate.

Dated the 9th day of September, 1937.

For the Applicants,

NORMAN R. CAMPBELL.

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*[This drawing is a reproduction of the Original on a reduced scale.]*

